

of knowledge, which have hitherto been regarded as sciences of pure observation, will work those wonders which it has worked, in so many other physical departments. One by one, we have seen light, heat, electricity, magnetism and electro-magnetism, fall within its grasp; and these are but preliminary chapters of the great treatise. And, what has it not done? it has rendered facts, heretofore supposed to be only discoverable by direct observation, deducible by processes of reasoning. The method of co-ordinates, first introduced by Descartes, which has cast such a brilliant light on Geometry, and revolutionised the physical sciences, is destined to act the same part towards chemistry. Even now, there are points in inorganic chemistry, on which the machinery of analysis can be brought to bear, as I propose, if health is continued to me, hereafter to show.

Hampden Sidney College, Virginia, Sept. 6th, 1838.

ART. VIII. *On Neuralgia of the Spinal Nerves, with Cases.* [From a Dissertation, read before the Connecticut Medical Society, at their annual meeting, May 9th, 1838.] By ISAAC G. PORTER, M. D., of New London, Connecticut.

THE term *neuralgia*, in its literal signification, does not embrace all the phenomena exhibited in the disease under consideration, the prominent symptoms consisting, not merely of *pain* in the course and origin of certain nerves, but also in abnormal action of the various organs to which they are distributed. To show the propriety of the appellation, however, compare an ordinary case of neuralgia (e.g. of the 2d branch of the 5th pair) with one resulting from irritation, either in the course or at the origin of a nerve proceeding from the medulla spinalis. In each, the structure primarily affected is the same, and the same cause may produce them, viz: irritation from pressure, or mechanical injury; or, for both alike, we may be unable to adduce any assignable cause. In each, pain is always more or less present as a prominent symptom; but if, because in the latter there is functional derangement of the organ to which the nerve is distributed, the term neuralgia be regarded as a solecism, with what propriety shall it be applied to a painful nervous affection of the optic nerve, terminating in amaurosis, or the same affection of an extremity, resulting in paralysis?

The design of this paper being, not to offer a full history of this disease and its essential character, as exhibited in its symptoms, &c., but merely to present a few observations which have been made while witnessing it, this part of the subject will be dismissed with one general remark: The doctrine of spinal neuralgia is founded on anatomy and physiology; and observation and experience are daily adding their sanctions to the deductions of science.

In our experience, decidedly the most efficient cause in its production, when it has suddenly supervened, the patient being previously in sound health, is actual violence; as a blow on the vertebrae, or a severe concussion of the spinal marrow from a fall. In other cases, a strain of the spine, as in powerful exertions at lifting, or in difficult parturition, has been often observed to be an active cause. The medulla spinalis does not occupy the whole canal in the vertebrae, and hence would be more likely to receive injury from a fall than even the brain. Its minute organization may have suffered, although a post mortem examination could not detect the injury. In other cases there appeared to have been, from youth, a peculiar irritability of the whole nervous system, which was roused to action by slight causes. Females are incomparably more subject to this affection than males. This may be owing to a peculiar delicacy of their nervous system, by which there is a greater susceptibility of impression, while at the same time their sympathies are more active. But there is another cause of this difference between the sexes, to be found in the fashion, which has long prevailed, of enveloping and confining the bodies of the one in stays or corsets. Some of the most obstinate cases under my observation have been referred by friends to this pernicious custom, and without any physiological knowledge to guide and influence their opinions. Do we not find, in this class of persons, that the muscles and ligaments of the trunk are unusually lax and attenuated? The following evils will naturally result: The compression of the body by means of materials sufficiently firm to afford an unnatural support, while it supersedes, in a great measure, the necessity of muscles and ligaments about the chest and spine, will, by the compression exerted, prevent their accustomed growth and strength. But how inadequate is the support afforded! Only revert to the effects of machinery in spinal distortions, and it will be apparent how far short that furnished by the best artificial means, falls, of the equal balance which nature affords. As a consequence, the spine, in the ordinary avocations and exposures of life, is constantly liable to injury from strains, falls, and the application of violence to the vertebrae. The medulla spinalis receives concussion, or the nerves, as they issue from the intervertebral foramina, are subjected to pressure, and disease supervenes. All this happens with more certainty, if, as is sometimes the case, the individual is, at the time of an accident, divested of her unnatural support. But perhaps still greater injury results, indirectly, from compression of the stomach, liver and lungs; the detrimental effects of which, acting primarily on the viscera, are thrown, by reflex action, on the spine.

In a late Number of this Journal, we find the following sketch of the views of M. Cruveilheir. "He maintains that affections of the stomach, heart, liver and lungs, frequently coincide with pain in a fixed point of the vertebral column, varying according to the organ diseased. He calls this spot the *dorsal point*. Painful diseases of the viscera are, it is well known, very often accompanied with pain in a determinate point of the vertebral column.

Cramps of the stomach, when arrived at their height, give way to a pain, more or less acute, about the fourth dorsal vertebra; and in some cases, the patient complains more of this pain than of the cramp of the stomach. This is observable, also, in ulceration and cancer of this organ. In hepatic colic this dorsal point exists, also, about the eighth or ninth dorsal vertebra. In all pains of the heart, whether nervous or sympathetic, or of organic lesion, whenever they attain a very great height, the dorsal point at the fourth or fifth vertebra accompanies the pain of the organ, and distracts the patient more than the pain of the latter, &c. Cruveilheir has found that greater relief is experienced by applying the remedies to the dorsal point than to the other parts; as, for example, patients affected with cancer of the uterus, receive greater relief from blisters, leeches and cauteries, to the dorsal point, than to the hypogastrium."

This view, though not new, endows the subject with fresh interest and importance. Is spinal neuralgia, then, a secondary affection, or is it primary? is it effect or cause, so far as the existence of certain anomalous symptoms is concerned? Probably it is both, according to circumstances. Regarding it as secondary to some other affection, the above statement must be taken in proof, rather than any extended observations of the writer. Severe functional diseases in any organ, produced by ordinary causes, may undoubtedly so influence the nerves of that organ, as, through a reflex action, to produce an abnormal state of the origin of those nerves. Take the well known example of headache from crudities in, or derangement of, the stomach. The par vagum, which arises from the brain and is distributed to the stomach, is irritated, and pain is felt at its origin. That this affection may in some cases be secondary, will still farther appear from the experiments of Marshal Hall, showing a reflex action of the medulla spinalis and oblongata with the corresponding nerves. The following is given by the physiologist just named, as a type of all the reflex actions of the spinal marrow, and of the excito-motary system of nerves. "If, in a turtle, from which the head and sternum have been removed, we lay bare the sixth or seventh intercostal nerve, and stimulate it by the forceps or by galvanism, both the anterior and posterior fins, with the tail, are immediately moved with energy—thus showing currents of nervous influence upwards, downwards, and reflex, with regard to the spinal marrow." This theory has been well expressed in these words by our able author: "It appears that each nerve has a point in the brain, or spinal marrow, with which it is in special relation. The sensory filaments go from a portion of the body to that point; the motor filaments pass from that point to the said portion of the body. Thus a sort of nervous circle is maintained; and into it every part of the body, supplied with sensory and motor nerves, and a corresponding point in the spinal marrow or brain, must enter." Guided by this theory, how beautifully are the phenomena of that disease, which, by the distinguished author of the theory, has been denominated mimosis, or imitator, explained. This, which is originally a mere

functional affection of the digestive system, soon involves the whole organism. Although functional, it may still be true that the nerves were in fault from the beginning. Travers, as quoted by J. Johnson, observes, that "functional diseases belong almost exclusively to the nervous system, and organic to the vascular." How common in this affection are tremors and numbness of the extremities, palpitation of the heart, obstinate hiccough and vomiting, with pyrosis, and convulsive and spasmodic affections. How easily are these explained on the theory that the original affection has been transferred, by reflex action of the nerves and medulla spinalis, which is "the source of tone in the whole muscular system," to show itself in other forms. The operation of this physiological law in explaining pathological conditions, will be daily more extensively noticed. Whether it will lead to more efficient treatment, remains, in a great measure, to be tested by experience. We may remark, however, that functional disease, occurring in any organ, no tenderness existing over the medulla spinalis, will probably be best treated by ordinary therapeutical means; but if, through a reflex action of the nerves the vertebre become tender on pressure, local depletion and external irritants to the spine *may* be of service, but we should argue, on theoretical principles, that they would be most so in such affections as sprang up subsequently to the existence of the spinal irritation.

The following cases, selected from many others of like import, will exhibit the prominence, which should be given to mechanical causes, in the etiology of this disease, and, also, the efficacy of a system of treatment, based upon the principle, of referring the anomalous and abnormal actions, which result, to a neuralgia of the spinal nerves. It is no small recommendation to say, that this plan of treatment proffers the means of cure, or of relief, in some of the most intricate, anomalous, and obstinate affections to which the human organism is subject. The cases which are annexed, while they will illustrate some of the leading points in this condition of the system, are probably sufficiently rare, to render their recital not uninteresting.

CASE I. An unmarried lady, now about thirty-three years of age, in the year 1822, was supposed to be affected with *morbus coxarius*, which continued three years, and was ultimately thought to be *cured*, but without the slightest deformity, by *solut. mur. calcis*. From the subsequent history of the case, may we not suppose that it was only a nervous, or hysterical affection of the hip joint, so well described by Brodie? She was next attacked with a neuralgia of one of the branches of the fifth pair of nerves, the pain locating itself in one of the *dentes cuspidati*. This was extracted, after which, the pain ceased for two weeks, but returned in the opposite one. This was also extracted, as were others that were successively attacked. Medical aid was now sought, and powerful narcotics, and tonics were resorted to, but without any appreciable effect. The agony continued, violent convulsions followed, and contrary to the judgment of the medical attendant,

he was forced to consent that another tooth should be extracted. This done, although the patient had been for hours insensible, and was regarded as in a dying state, the pain and convulsions, either from the local abstraction of blood, or from some other cause, immediately ceased. But the truce was of short continuance. Another tooth was attacked and extracted, and another, until the dentes sapientiae, then in an immature state, were with difficulty removed. Thus, after a continuance of six months, the disease took its departure to return only occasionally, and for a short time, in the maxillæ.

In the year 1831, while endeavouring to raise her dying father, she felt, to use her expression, a snap, or severe shock, in the dorsal portion of the spine, followed by acute pain in the left side, circumscribed for the most part, being confined to a small spot, two inches to the left of the scrofuliculus cordis, but darting through to the spine. Occasionally during the two succeeding years, the pain would attack the bowels, producing the most intense colic-pains, alternating with profuse discharges of blood, purulent matter, and a substance resembling tar or molasses.

November, 1834. Forced to resort to her bed, for more than a year; she was unable to leave it, through the distress caused by turning, or motion of any kind. During all this period, however, so great was the dyspnœa, that she could rarely indulge in the horizontal position. A blister applied to the sternum would increase the difficulty of breathing, while one applied on the left side, over those spinal nerves primarily affected, would in some measure mitigate her sufferings. Calomel in small doses was now resorted to, but owing to its unsavourable effects, it was soon discontinued.

March, 1835. There was, at this time, a sudden and violent increase of the pain in the side; an incessant cough now commenced, and spasms, the most excruciating, darted through the chest to the spine. The bowels were not moved for weeks, and the mucous membrane of the mouth and œsophagus, were much ulcerated and abraded. Next the most obstinate vomiting commenced, which, after continuing for three days, was checked by a blister over the stomach and left side. Immediately on its cessation, pyrosis commenced. The discharge resembled a very thin mucilage, was insipid and transparent, and ran from the mouth, while the patient slept, so profusely, as in a single night thoroughly to wet ten or twelve towels. The paroxysms became so severe, that the patient would faint, and for a long time remain insensible, and would return to consciousness, only to find the same insupportable distress. The scene changed to the lumbar vertebrae, and, from that time until a recent date, the bearing-down pains in the uterine region were so intense, that although resting in the horizontal position, or nearly so, her sufferings would, for hours together, equal those of a woman in labour. The urinary function was also much deranged, water being sparingly secreted, or if more abundant, pale, and discharged with difficulty.

May, 1835. With this change in the symptoms just referred to, there was a corresponding variation in the character of the sputa. From being

transparent and colourless, it now assumed a "bluish" hue, and appeared much like thin starch, tinged with indigo. Rather thinner than the white of an egg—like that substance, it was tenacious and ropy, and the surface of the fluid, was always covered with a thick froth. The quantity raised during the succeeding six months, amounted on an average, to a quart in twenty-four hours. Frequently it would surpass that amount, the quantity varying with the violence of other symptoms. In the same proportion, the bluish tinge was deepened. In the night, the patient was often nearly suffocated. Morphine would check it, but at the same time tightened the cough, and greatly increased the dyspnoea. A burning sensation constantly existed in the stomach, accompanied by much local heat, externally; yet contrary to what is usually found in pyrosis, the fluid which appeared in the mouth was never eructated. She would often vomit, at once, half a pint of a similar fluid. Coughing would also cause its appearance.

During the summer of 1835, there were almost daily paroxysms, which seemed to threaten the life of the patient. In September, she became very hoarse; had a regular phthisical cough, with chills every afternoon, followed by fever, which was succeeded by night sweats. Owing to the dyspnoea, which with the cough, and the pyrosis, had proceeded "pari passu," with the distress in the side, there was an entire inability to recline in bed. Turning from side to side, even with assistance, would cause the most excruciating distress throughout the whole trunk of the body.

It is now three years since this case first came within the writer's notice, and at the almost desperate stage which has just been described. Its history, therefore, has been furnished by the patient herself, who is intelligent, and remarkably free from that disposition to magnify sufferings, which is sometimes found in hysteria. The account, as given by her mother, who is entitled to high credit, coincided in all points with the foregoing. Most of the symptoms, the writer had an opportunity of witnessing, particularly the pyrosis. It was now suggested to her, that her disease might consist in spinal irritation. The whole length of the spine, below the fifth dorsal vertebra, was found, on examination, tender on pressure, and although but little force was used, the pain continued very severe for hours. The seventh, eighth and ninth dorsal, and the third and fourth lumbar, were peculiarly sensitive. The treatment pursued need not be detailed in full. The first blister rendered turning in bed easier, and induced the return of the catamenia, which had been absent for many months, and since that time they have continued perfectly regular. The second blister considerably diminished the pyrosis, which soon after ceased entirely, to return only in small quantity, when from fatigue, or taking cold, the pain in the left side is renewed. One symptom after another yielded, so that the patient was soon after able to leave her bed, became free from pain, and now attends to her usual avocations about the house. There is, as in all chronic cases of this disease, a peculiar susceptibility to slight relapses, but they have speedily yielded to

ung. tart. antim. and cups to the affected vertebræ, with an occasional dose of calomel. For the last year, up to the present time, (August, 1838,) she has been subjected to no medical treatment, except the application of two or three cups, and as many blisters.

The most interesting point in the foregoing case is the excessive pyrosis. It will be recollect, that for eight months, the quantity raised amounted, on an average, to one quart a day. Some pathologists have regarded it as an idiopathic disease, others, as depending on a diseased state of the mucous membrane. That this membrane is affected no one can doubt, but ought it not, more frequently, to be regarded, as symptomatic of spinal irritation? It is often noticed in co-existence with this affection, and when it occurs in dyspepsia, may it not often be traced, through a reflex action of the nerves, to spinal or ganglionic irritation? It rarely yields to ordinary internal treatment, and in severe cases, the spine should undoubtedly be examined. It is true, that were the ganglionic system alone affected, no tenderness of the vertebræ, may exist, and yet local bleeding, with occasional blisters, to the spine, may prove serviceable. The instance related above, yielded so evidently and completely to such a course of treatment, that no one can doubt its origin, or believe that any other course of medication would have proved equally successful.

CASE II. Mrs. S., 30 years of age, the mother of one child, was, in the fifth month of pregnancy, accidentally precipitated down a flight of stairs, and injured the lower dorsal and upper lumbar vertebræ. Although abortion was not produced, yet great tenderness of the part was caused, which has continued until a recent date. After delivery, profuse flooding followed, which, for six months, could not be successfully checked. Subsequently, the discharge returned every two weeks, and continued eight or ten days at each period. Until pregnancy, the menses had been perfectly regular, and she enjoyed sound health. Various means were employed to check the menorrhagia, but without effect. At the same time, attacks of anomalous disease were frequent and debilitating, assuming, at one time, inflammation of the liver, for which blue pill and blisters were prescribed with ultimate benefit. There was also profuse hæmoptysis, but without cough, ischuria requiring the catheter; and also suppression of urine, not more than eight ounces being secreted in thirty-six hours.

December, 1836, four years after the birth of her child, she came under the care of the writer. The menorrhagia still continued, and a severe pain in the left side had just seized her. A blister, although it produced full vesication over the seat of the pain, had no effect in quieting it, and it now became excruciating with every breath. Inquiring into the state of her health at former periods, and learning the foregoing history, the spinal column was examined. All the vertebræ below the eighth and ninth dorsal were found tender on pressure—the pain in the side being much increased

by the examination. As soon as the appropriate action of a blister to the spine could be produced, the pain in the side was relieved as by magic. In six or eight weeks she was more free from disease and suffering than for years before. She was then attacked with a sharp pain in the whole upper portion of the spine. This was relieved by a blister; but was followed by the most excruciating pain in the left side, just below the ribs. Difficult as it may be to explain, there was not the least pain or tenderness in any portion of the spine. Was it because the pain in the side was so severe, that under ordinary pressure the amount of pain caused formed but a faint comparison with the agony (for it was actually such) which existed in the side? A blister of the best cantharides plaster produced not the least smarting or redness, although vesicating a patient admirably in an adjoining room—nor yet when made with a threefold proportion of cantharides—nor even when the surface had been previously rubbed with warm oil of turpentine, nor when covered with an undiluted mustard paste. A very strong pulsation had existed for a week in the seat of the pain, which was located about one and a half inches above, and the same distance to the left, of the umbilicus, and which appeared like an aneurism of the cœliac artery. The throbbing was synchronous with the pulse, but incomparably stronger. By grasping the integuments, the fingers would come in contact with it, giving the sensation of its being as large as the little finger. It could be distinctly felt through all the clothes, and even jarred the bed, annoying the patient; and, together with the pain, preventing all sleep. At one time the patient became very faint—pulse a mere thread—and she appeared dying. Nothing had recently been retained on the stomach—the bowels were costive, and tongue covered with fur. Blisters to the spine were not tried, as no tenderness existed. Active purgatives of extract of colocynth and calomel, when the stomach was able to retain them, were of much service. Nervines and anti-spasmatics, with black drop, had not the slightest effect in producing relief. In three weeks from the attack the throbbing and pain began to diminish, and soon entirely ceased, with the return of health. The derangement in the catamenia had been gradually improving, since the application of the first blister to the lumbar vertebrae. A few more completely removed all irregularity; which condition has continued ever since. Two successive summers, since, she has had a singular headache, which was much increased by pressure over the upper cervical vertebrae; also, much nausea, vomiting, and diarrhoea, with tenderness of the corresponding vertebrae. Blisters were applied without the ordinary good effects. Leeches, however, proved immediately successful; and at the present time (August, 1838) she is in good health.

From the absence of spinal tenderness accompanying the pulsation, simulating aneurism, it may have been only a local hysterical affection; or, from the relief afforded by cathartics, may we not suppose that there may have been a collection of faeces in the left arch and ascending portions of the colon, which aggravated, if it did not produce the affection. Another supposition

is, that from the excessive and long continued loss of blood there may have been anæmia, a condition of the system in which local pulsation is by no means unfrequent.

CASE III. Mrs. N., 35 years old, formerly enjoyed perfect health, but has recently been regarded as *hysterical*. All her sufferings she traces to a severe strain in the back, received while shaking a carpet. In the summer of 1837, while suffering under anomalous symptoms, the vertebrae were found tender on pressure. Violent pains existed in the stomach, with pyrosis, as in Case I. There was also the impression that the parietes of the stomach were drawn by cords to the spine; and that this connection drew her body forward, in which position it was immovably fixed. All the symptoms were relieved by venesection and blisters to the spine.

October, 1837. Six months since, while engaged in some laborious occupation, the motions of the heart became singularly changed, which affection has continued, at intervals, ever since. Violent paroxysms of jumping and trembling of the heart would occur, followed, for some minutes, with ordinary palpitation—and returning, spontaneously, many times in a day. The heart examined externally, at these seasons, appears much hypertrophied; and its motions were so violent as to give the impression that it must burst its parietes. There was tenderness not only of the corresponding vertebrae, but also of the posterior surface of the thorax opposite the heart. The stomach was also singularly deranged. In her tautological language she often compared it to a "*great hollow hole*," within which was a constant crawling sensation that excited a dry hacking cough, with occasional expectoration; which was "*salter, if possible, than brine*." Treating it as a case of hysterical nervous excitement—emetics, castor, assafœtida, and valerian were tried in large doses, also a plaster of assafœtida to the region of the heart. All, however, in vain, so far as preventing a return of the paroxysms. Pressure of the vertebrae increased the stricture of the stomach, and the palpitation of the heart. A blister to the spine, for a time, aggravated all the symptoms; but the application of a poultice, and the administration of a dose of calomel, soon permanently relieved all the distressing affections, since which period she has enjoyed good health.

CASE IV. A man, 50 years of age, addicted to intemperance, was affected with hiccough to such a degree, that he could neither eat in any peace, nor sleep; and having continued ten days, he said that he could not endure it much longer. There was great tenderness of the third cervical vertebra, at the origin of the phrenic nerve, which is distributed on the diaphragm. A blister was applied to the tender vertebra; and, as soon as vesication commenced, the affection was removed.

A similar case, in a late subject, occurred within the present month, (August,) with the same tenderness over the upper cervical vertebra, which was relieved,

not so soon as vesication commenced, but immediately on the inflammation, which was thereby caused, being moderated by a poultice.

Whence proceed the symptoms so prominent in the cases just detailed, and so common in intemperate persons, especially after a debauch? May it not be regarded as showing the reflex action of the nerves? Irritation existing in the stomach, it is thrown upon the diaphragm, which is immediately contiguous; thence it is transmitted through the phrenic nerve to its origin, subsequently to become manifest in convulsive action of the diaphragm. In language which has already been quoted, "sensory filaments go from a portion of the body" (diaphragm) "to that point" (a point in the brain or spinal marrow, with which the phrenic or diaphragmatic nerve is in special relation) "and motor filaments pass from that point to the said portion of the body."

CASE V. The patient, a young lady now 22 years of age, was thrown from a wagon in September, 1836, and dragged for some distance on the ground, by becoming entangled in some part of the harness. She is ignorant what portion of the body received most injury, but from the circumstance that her corset-board (hickory) was broken, while the lacings remained entire, she thinks her stomach must have received some contusion, and that the back was strained by a forcible bending of the body. She fainted, and it was long before she could be removed, owing to the spasms which motion caused. Much numbness, and incessant vomiting, for three days, followed; neither solid nor fluid, in the smallest quantity, being retained. Previous health in all respects good; but since the fall, menstruation has become deficient in quantity and irregular in its returns. There has also been great weakness in the back, much headache, and obstinate costiveness. The vomiting ceased for a time, but gradually returned, with an uneasy feeling in the stomach, even when empty. Since July, 1837, until recently, she has retained almost nothing on the stomach, every thing being eructated the moment it was swallowed. A morsel of hard bread, or a little sugar or tea, or a pill, would occasionally be retained, but not without great distress; and ordinarily, after it had been in the stomach for hours, it would be thrown off as undigested and with the same taste and smell as when swallowed. Pyrosis, and great acidity of the stomach prevailed, with ulceration of the mouth and fauces. Notwithstanding the little that was retained on the stomach, her appearance by no means betokened great emaciation. This is generally the case in spinal neuralgia, or at least the external appearance is not such as would be expected from the violence and long continuance of the disease.

March 11th, 1838. There has been no evacuation of the bowels literally for weeks, and the vomiting and other symptoms are urgent. Great tenderness was found to exist from the lower cervical to the eighth or ninth dorsal vertebra; also a numbness extending to the left shoulder and arm. Resolved to try the effects of ordinary remedies first, oxide bismuth was ordered, with a blister to the stomach. The former, like every thing else,

was immediately vomited, but the latter relieved the pain in the head, and greatly benefitted the ulceration of the mouth; at the same time it greatly increased the tenderness of the vertebra opposite the stomach. The vomiting still continued unmitigated. A blister to the affected vertebra (for leeching or cupping she would not submit to) seemed, if possible, to increase all her sufferings. The head was more painful; and not a particle of any thing could be retained on the stomach, and no motion of the bowels had been obtained for weeks. Ineffectual efforts at vomiting were constantly maintained, even when nothing had been taken upon the stomach. Even calomel was immediately ejected, in whatever vehicle taken, and enemata had no effect in moving the bowels.

20th. Acet. morphiae was given in hopes of quieting the stomach, followed by croton oil, but both were vomited. Next, after removing the cuticle from the epigastrium, by means of a blister, acet. morphiae, $\frac{1}{2}$ gr., was applied every three hours, and each application followed by calomel, gr. ii, taken nearly dry into the mouth. Four applications of the morphia were made, and after continuing the calomel, a part of which was vomited, less frequently for three days, the bowels were moved. The motions were exceedingly offensive, resembling tar, or molasses, and were followed by a diarrhoea and discharges of blood, with great pain in the bowels. Hitherto, the therapeutic course adopted had only seemed to aggravate, rather than relieve. But this result was not unexpected, the same effect having been witnessed, for a time, from severe external irritants to diseased vertebræ. A slight salivation was caused, and when the effects of this began to decline, and the blister to heal, she rapidly regained a comfortable state of health. Her stomach became much less irritable than for months before, and considering the state in which it had so long been, it was not surprising that it did not at once recover its tone. She now retains light diet, in small quantities; her headache, and the distress in the stomach, have entirely ceased, and her bowels, from being obstinately costive, have become perfectly regular in their functions; and so well was she, that early in April she passed from under my observation.

The following case resembles one recorded by Sir Charles Bell, in his "Consultations and Cases," and although it differs in its pathological relations from the foregoing, yet, depending doubtless upon an affection of the nervous system, it has its points of affinity. In Mr. Bell's case, probably, no plan of treatment was found serviceable, for none is recorded, and he adds: "All the subjects of these odd cases, which we do not understand, get well. This is consolatory to a patient, certainly, but not very satisfactory to ourselves."

CASE VI. *January, 1838.* A young lady, thirteen years of age, of a phthisical family, was, after active exercise, the next day attacked with a cough, which was usually short and dry, consisting ordinarily of one expiration, but on motion or under excitement, of several successive, loud and barking expirations, but without expectoration. This "hack," or short cough, was re-

peated, on an average, three times in a minute, and at intervals, for a length of time, it would return every third second. While she slept, however, there was a perfect respite; and sleep, whether natural or obtained by narcotics, had the same effect. Only a weak anodyne, if given at the hour of retiring, was necessary to procure quietness until the next morning, when the same incessant barking was heard by the family. Her health in other respects was good; pulse and appetite nearly natural, and tongue but slightly coated. An enlargement of the tonsils had for some time occasionally existed, and as such was now the case in a slight degree, the cough was at once referred to that source; but the tumescence soon entirely subsided, without inducing any mitigation of the cough. The uvula was of its natural length, and no tenderness existed about the throat except towards evening, after having coughed through the day. There was no pain or soreness about the chest, and the respiration during sleep was natural. No hoarseness except in the evening.

Among the remedies resorted to, were demulcents, with ipecac. and opium,—vermisfuges, spigelia and ol. terebinth.—mercurial and other cathartics,—gargles of capsicum and solut. nit. argent. applied with a pencil,—emetics, castor, and assafet., ext. hyoscy., and iodine in the form of tinct., and burnt sponge. Supposing that it might arise from an enlargement of the tonsils, blisters were twice applied to the top of the sternum and the back of the neck. The swelling subsided, but not the cough. In this manner it continued for six weeks; and, considering the constitution, giving rise to much anxiety as to the issue. A remedy, just alluded to, was now tried in a new form. The whole *front* of the neck and fauces was covered with a blister, which almost in a night removed the affection, and left the patient weak, but otherwise in ordinary health.

After what has been said on the subject in the detail of the foregoing cases, the treatment need not detain us. Calomel, in purgative doses, is often one of the most efficient remedies; carried to the point of salivation, it has seldom or never been purposely resorted to, and cannot often be borne for any length of time. Opiates in some one of the various forms of morphine, black drop, or elixir of opium of McMunn, with other narcotics, have been more or less used in almost every case. Blisters to the spine have always maintained the first place in our therapeutics. Our opinion, however, has been modified by experience. Through the proximity of the medulla spinalis to the surface, or for some other cause, the irritation produced by blisters and tart. ant. ung. is so great, that, in very susceptible subjects, they often for a time appear to increase rather than diminish the original affection. In almost every case, however, they are ultimately followed by decided improvement. For the sake of avoiding irritation, and securing an immediate action, leeches and cupping are generally preferable.

We may be too sanguine in our ideas of the importance of this subject. Cases of obscure, perhaps ganglionic, disease may exist when the tenderness of the vertebrae will not be detected, and when a course of local depletion and

external irritants to the spine will prove of little or no advantage, yet it is our candid belief that a correct practical estimate of this subject, as presented in the writings of recent authors, will do as much to relieve human suffering as any other single improvement, or discovery in medicine, of the present century.

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ART. IX. *Cases of Necrosis illustrating the Practice of Exposing and Perforating the Diseased Bone at an early period in the progress of the malady.* By T. MORVEN SMITH, M. D., of Baltimore.

WRITERS on the subject of Necrosis have almost universally directed their attention too exclusively to the very common result of that disease, the death of bone, and have neglected to investigate satisfactorily the pathology of the early stages of the malady, and the remedies calculated to arrest its progress in its incipiency. The writings of Weidemann, of Boyer, Bell and others, are defective in this particular. The death of bone is no more the necessary result of this disease than is hydrocephalus the necessary sequel of inflammation of the membranes of the brain. The term "necrosis" is indeed not less unfortunate in its application than that of "hydrocephalus," and the strict definition of it has led to the same errors in pathology and practice.

The following cases are designed to illustrate and justify pathological views, and a mode of treatment suggested some years since by my father, the late Professor N. Smith of Yale College, in his surgical memoirs. He regarded the disease as simply an inflammation of a bone, owing its too common result, death of the organ, to its anatomical structure. He regarded the deposite of pus in the cavity of the bone as the cause of its death, and maintained that the result could be averted by perforating, or trepanning, the bone at an early period. In the following cases it will be seen that this plan was adopted, and that it was successful in every case,—in one, indeed, in which the time which had elapsed would seem hardly to have justified such an expectation.

CASE I. July 26th, 1835, I was called to visit the son of Captain Morley, of West Springfield, ætat. 16. I found the patient suffering from severe pain in one leg, particularly in the ankle. The lower portion of the leg, the ankle, and the foot, were much swollen; the pulse was hard and quick; skin hot, the tongue white, the patient extremely restless, the least jar or motion of his bed causing him to cry out. The father's account was that his son had been perfectly well until three days previous, when he was taken with pain in one ankle, after having laboured for several hours exposed to a hot sun, at the same time standing ankle deep in cold spring water.